Name:	

Slope function of sine curve

We will:

- measure the slope, m, of a sine curve at multiple values of x
- make a table of pairs of x and m(x)
- plot the slope function: y = m(x)
- determine an algebraic function that matches those pairs
- summarize, rephrase, and interpret

Set up Desmos to find slope

- 1. Open Desmos graphing calculator
- 2. To draw sine function, enter expression

$$f(x) = \sin(x)$$

3. To draw a point at x = a, enter expression

and make slider for a.

4. To draw a point at x = a + h, enter expression

$$(a+h, f(a+h))$$

and make slider for h.

5. To calculate the slope between points, enter expression

$$m = \frac{f(a+h) - f(a)}{h}$$

6. To draw the line through points (using point-slope form), enter expression

$$y = m(x - a) + f(a)$$

7. Tinker with a and h to make sure you understand their significance.

Tinker with h while a = 1

- 8. Set a equal to 1.
- 9. Vary h between the values 0.1, 0.01, 0.001, and 0.0001 while recording m. Fill out the table below.

a	h	m
1	0.1	
1	0.01	
1	0.001	
1	0.0001	

10. What did you just do, and what did you just find? Use your words (and maybe a sketch) to interpret the above table.

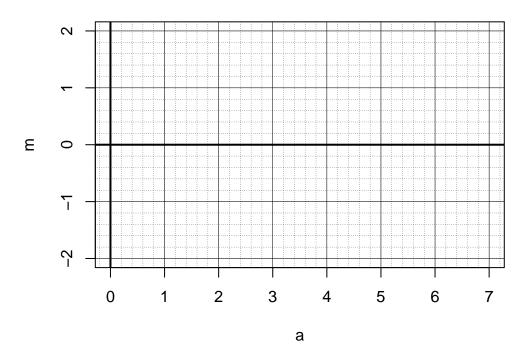
Tinker with a while $h \leq 0.1$

- 11. Set h equal to 0.1 or smaller. Its exact value should not matter much.
- 12. Let a vary between 0 and 6.5 with a step size of $\frac{1}{2}$. Record the slopes, rounded to hundredths.

a	m
0	
0.5	
1	
1.5	
2	
2.5	
3	

a	m(a)
3.5	
4	
4.5	
5	
5.5	
6	
6.5	

13. Plot those ordered pairs below.



- 14. Consider the parent functions. Do any of them resemble the plot above?
- 15. Rephrase. What did you do? What did you learn? How would you explain this?